2003 Tick Surveillance Report

FINAL

February 26, 2004

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PURPOSE

The purpose of Tick Identification is to assist healthcare professionals (physicians, veterinarians, etc) to determine if a victim has encountered a species of tick that is a potential vector for disease, most importantly Lyme Disease. Over the past ten years in Erie County, there have been no reported human cases of Rocky Mountain Spotted Fever, 2 cases of Babesiosis (1994), 1 case of Ehrlichiosis (1995), and 109 cases of Lyme Disease. The following table shows reported human cases of tick borne diseases in Erie County over the past ten years.

Reported Communicable Diseases in Erie County											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
Babesiosis	2	0	0	0	0	0	0	0	0	0	2
Ehrlichiosis	N/A	1	0	0	0	0	0	0	0	0	1
Lyme Disease (unconfirmed)	27	25	14	7	9	10	8	4	4	1	109
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0	0	0
Information from Erie County Health Department – Disease Control Bureau N/A = Not Available 2003 figures are provisional											

The Vector and Pest Control Lab of the Erie County Health Department has been performing identification of ticks since May of 2001. The Vector and Pest Control Lab has received 275 (94 in 2003, 123 in 2002, 58 in 2001) specimens for identification to date. The service is currently being provided free of charge. The cost incurred by the Erie County Health Department to provide this service was reimbursable by the NYSDOH at a rate of 36% but is no longer reimbursable.

TICK SURVEILLANCE PERFORMED

TARGET SPECIES

The following table describes the target species of ticks in Erie County and the Western Region of New York State.

Species	Common Name	Potential Vector of:
Amblyomma americanum	Lone Star Tick	Ehrlichiosis Tularemia
Dermacentor variabilis	American Dog Tick	Ehrlichiosis Rocky Mountain Spotted Fever - *Rickettsia rickettsii* Tularemia
Ixodes cookei	Woodchuck Tick	Not known
Ixodes marxi	Squirrel Tick	Not known
Ixodes scapularis	Blacklegged (Deer)Tick	Babesiosis Ehrlichiosis Lyme Disease – *Borrellia borgdorferi*
Rhipicephalus sanguineus	Brown Dog Tick	Ehrlichiosis

METHODS

Provide the service of Tick Identification to local physicians, hospitals, laboratories, veterinarians or private citizens upon request. The victim of a tick might be a human, dog, cat or other animal. Microscopic identification is performed usually within 48 hours and not more than one week. Each Tick was identified by species, common name, sex, and degree of engorgement. Identification is performed using the following as reference for adult ticks:

"Pictorial Key to the Adults of Hard Ticks, Family Ixodidae (Ixodida:Ixodoidea) East of the Mississippi River." James E. Keirans and Taina R. Litwak. J. Med. Entomol. 26(5): 435-448 (1989)

"The Genus Ixodes in the United States: A Scanning Electon Microscope Study and Key to the Adults." James E. Keirans and Carleton M. Clifford. J. Med. Entomol. Suppliment 2: 1-149 (1978)

Identification of ticks in the Genus *Ixodes* that are nymphs is performed using the following reference:

"Nymphs of the Genus Ixodes (Acari: Ixodidae) of the United States: Taxonomy, Identification Key, Distribution, Hosts, and Medical/Veterinary Importance." Lance A. Durden and James E. Keirans. Entomological Society of America. 1996.

In 2003, 94 specimens have been submitted for identification. The breakdown by species is as follows.

TICKS IDENTIFIED					
Species	Common Name	Number Identified			
		2003	2002	2001	Total
Amblyomma americanum	Lone Star Tick	3	10	4	17
Amblyomma maculatum	Gulf Coast Tick	0	1	0	1
Aponomma latum	Snake Tick	1	0	0	1
Dermacentor variabilis	American Dog Tick	23	54	26	103
Dermacentor albipictis	Winter Tick	0	1	0	1
Ixodes cookei	Woodchuck Tick	19	14	6	39
Ixodes marxi	Squirrel Tick	0	1	4	5
Ixodes muris	None	1	0	0	1
Ixodes scapularis	Blacklegged (Deer) Tick	33	16	9	58
Ixodes spp.	Ixodes species*	1	1	0	2
Rhipicephalus sanguineus	Brown Dog Tick	2	5	0	7
Ticks Identified		83	103	49	235
Specimens other than Ticks Identified**		11	20	9	40
Total Specimens Received		94	123	58	275
* Tick damaged. Features missing for complete identification. ** See Appendix for details.					

Our primary target species for Tick Identification is *Ixodes scapularis*, the vector of Lyme disease. Over the past 3 years, 24.7% of all ticks identified have been *Ixodes scapularis.* The yearly breakdown is 40.0% in 2003, 15.5% in 2002, and 18.4% in 2001. The increased numbers if specimens received identified as *Ixodes scapularis* may be indicative of one or both of the following factors: a greater population of the species in the area or a greater awareness of tick-borne diseases. This cannot be statistically proven due to the small sample size.

Ixodes Scapularis, the Blacklegged Tick or Deer Tick - Dorsal View

There were three unique cases in late 2002 and 2003. Each involves a tick that is rarely observed in this area. The following photos and text briefly describe each case.

***Amblyomma maculatum*, the Gulf Coast Tick.**

This event was the first recorded occurrence of the Gulf Coast Tick in Erie County. It was sent for identification by the victim's father and was collected on December 12, 2002. The victim was an adult female whose only travel history was listed as "Walks dogs near Reinstein Woods and at Como Park." The tick was an intact unengorged adult male. The identification was verified by Dr. Wayne Gall, Regional Entomologist for the NYSDOH.

Amblyomma maculatum, the Gulf Coast Tick
Dorsal View

Amblyomma maculatum, the Gulf Coast Tick
Ventral View

***Aponomma latum*, the Snake Tick**

This tick was collected from a Ball Python at Sheridan Animal Hospital on January 7, 2003. It could not be identified using the current reference keys. It was sent to the USDA, National Veterinary Science Laboratory and identified as a Snake Tick. The remarks on the report stated, "This is the most common tick parasite of large snakes in most of sub-Saharan Africa and in the pet trade worldwide. It frequently arrives in the USA on imported pet pythons especially from West African countries."

Aponomma latum, the Snake Tick
Dorsal View

Aponomma latum, the Snake Tick
Ventral View

***Dermacentor albipictis*, the Winter Tick**

This tick was sent by Arnot Odgen Medical Center. It was collected from an adult male on November 5, 2002. It was attached to his left hip. The victim was deer hunting in Schuyler County and observed other ticks on a deer. The tick was an intact unengorged adult male. This species of tick is known to reach the adult stage during the winter months.

Dermacentor albipictis, the Winter Tick
Dorsal View

Dermacentor albipictis, the Winter Tick
Ventral View

The following table describes the numbers of specimens by victim.

Workload by Victim				
Victim	Number of Specimens			
	2003	2002	2001	Total
Human	27	51	35	113
Dog	51	57	16	124
Cat	8	3	2	13
Other	8	12	5	25
Total	94	123	58	275

The following table describes the numbers of specimens by client type.

Workload by Client Type				
Client Type	Number of Specimens			
	2003	2002	2001	Total
Hospitals/Laboratories	10	15	12	37
Physicians	1	15	6	22
Private Citizens	16	44	13	73
Public Health Agencies	10	7	8	25
Veterinarians	57	42	19	118
Total	94	123	58	275

The following table describes the number of specimens by month.

Workload by Month				
Month	Number of Specimens			
	2003	2002	2001	Total
Jan	3	1	--	4
Feb	1	0	--	1
March	2	3	--	5
April	6	4	--	10
May	15	11	6	32
June	15	48	17	80
July	19	21	15	55
August	5	15	8	28
September	5	8	2	15
October	10	2	3	15
November	8	8	7	23
December	5	2	0	7
Total	94	123	58	275

REGIONAL AND INTER-AGENCY ISSUES

The Vector and Pest Control Lab made its service of Tick Identification available to physicians, veterinarians and private citizen in any of the western region counties of New York State. Of the 275 specimens identified, 32 were from outside Erie County.

The following table describes the number of specimens by county of residence of the victim.

Workload by County				
County	Number of Specimens			
	2003	2002	2001	Total
Chemung	2	8	2	12
Erie	87	111	45	243
Genesee	1	0	1	2
Livingston	0	0	1	1
Niagara	1	1	1	3
Orange	0	0	1	1
Schuyler	2	1	0	3
Seneca	0	0	1	1
Steuben	1	1	2	4
Wyoming	0	1	4	5
Total	94	123	58	275

The Vector and Pest Control Lab has worked closely with Dr. Wayne Gall, Entomologist for the Western Region Office of the NYSDOH. He has supplied technical assistance to the Vector Lab in the form of identifying insects not ticks and verification of identification for several ticks.

PROGRAM CHANGES IMPLEMENTED IN 2003

In 2001 and 2002, it has been problematic when identifying damaged ticks and ticks that are not in the adult stage. To alleviate this problem, the following references have been acquired and used in 2003.

"The Genus Ixodes in the United States: A Scanning Electon Microscope Study and Key to the Adults." James E. Keirans and Carleton M. Clifford. J. Med. Entomol. Suppliment 2: 1-149 (1978)

"Nymphs of the Genus Ixodes (Acari: Ixodidae) of the United States: Taxonomy, Identification Key, Distribution, Hosts, and Medical/Veterinary Importance." Lance A. Durden and James E. Keirans. Entomological Society of America. 1996.

The program currently has the equipment to perform digital photography with the Leica GZ7 Stereo-Zoom Microscope. This will be used mainly for training purposes. It can also be used to electronically send photographs of ticks that are rare or difficult to identify to experts in the field of entomology. It was used to photograph a few ticks that are less commonly seen in this area. It can be utilized more when the Vector Lab computers are changed from Windows NT, which is unable to interface with the camera.

The Vector Program has updated the "Protocol for Tick Identification Service" and the "Tick Identification Request Form." Both documents have been sent to all clients who have utilized this service in the past and to all veterinarians in the Niagara Frontier Veterinary Society.

The Vector and Pest Control Program planned to put in place a Microsoft Access Database for Tick Identification data. This database was to be used for data entry, identification entry, result reporting and statistics. This database will be used in conjunction with HealthNet. This was not completed due to technical problems and time constraints. The idea may be revisited in 2004.

PROGRAM CHANGES PLANNED FOR 2004

It has been suggested by Dr. Wayne Gall to share our tick surveillance data with the NYSDOH Tick Identification Service in order to have a centralized database of tick information in New York State. They would in return supply the Vector Program with any data from ticks they have received from Erie County.

APPENDIX

PROTOCOL FOR TICK IDENTIFICATION SERVICE (INCLUDES REQUEST FORM)

ERIE COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH WELLNESS
VECTOR AND PEST CONTROL PROGRAM

462 Grider Street Room BB-122
Buffalo, NY 14215
716-898-3324

Protocol for Tick Identification Service

Specimen Collection, Transport and Storage
Updated: October 14, 2003

Requisition Form:

The proper form for requesting tick Identification is the:

- Erie County Health Department Tick Identification Request Form revised 6/03.
- When sending multiple ticks, a separate form must accompany each tick.

Specimen Collection Information:

In removing and submitting ticks for identification, use the following procedure:

- Carefully remove ticks by grasping them as close to the skin as possible using fine tweezers and pull gently but firmly until they let go.
- Do not squeeze ticks or handle them with your bare hands.
- Place the whole tick in a tightly sealed container. Label with the victims name and date collected.
- Package carefully in a crush-proof container and send to the above address.

Specimen Transport Information:

Specimens for Tick Identification in a tightly sealed container, packed in a crush-proof package can be transported to the Vector Lab by:

- US Mail to Address listed above and on the Requisition Form.
  Specimens are picked up from the mailroom at ECMC each business day.

- Hand-deliver directly to lab.
  Vector & Pest Control Program
  462 Grider Street – Room BB122
  Buffalo, NY 14215
  (716) 898-3324
  (716) 898-6163 fax

- If there is no one at the Vector Lab to accept the specimen, deliver to the Erie County Public Health Lab for storage/holding.
  Erie County Public Health Laboratory
  Clinical Center Building AA
  462 Grider Street
  Buffalo, NY 14215
  (716) 898-6105
  (716) 898-6110 fax

  The Public Health Lab should call the Vector Lab to notify that a specimen is being held for Tick Id. Voicemail is acceptable. The Vector Lab will pick up the specimen by the next business day.

- Hand–deliver to one of the four district offices of the Erie County Health Department.

Buffalo District Office 462 Grider Street-Building BB Buffalo, NY 14215 (716) 691-6800 (716) 691-6880 fax	Hamburg District Office 17 Long Avenue Hamburg, NY 14075 (716) 649-4225 (716) 649-4223 fax
Lancaster District Office 85 Manitou Lancaster, NY 14086 (716) 683-6487 (716) 683-5517 fax	Tonawanda District Office 250 Cortland Avenue Tonawanda, NY 14223 (716) 874-1070 (716) 874-1076 fax

The Erie County Health Department District Offices should call the Vector Lab to notify that a specimen is being held for Tick Id. Voicemail is acceptable. Place the specimen container in a "ziploc" bag, and a brown paper bag labeled "Vector Lab." The interoffice courier can then deliver the specimen directly to the Vector Lab.

Specimen Storage/Holding Information:

- Specimens for Tick Identification must be in a tightly sealed container. This container may contain only the tick specimen with no media or it may contain alcohol as a transport media.
- The specimen container must be labeled with the victim's/patient's name.
- The specimen can be held at room temperature or under refrigeration whichever is more convenient.

Identification Performed/Results Reporting

- Specimens received will be processed for identification the day they are received in lab.

- Identification performed within 48 hours not including weekends and holidays using the following reference. Additional references used as needed.

"Pictorial Key to the Adults of Hard Ticks, Family Ixodidae (Ixodida:Ixodoidea) East of the Mississippi River." James E. Keirans and Taina R. Litwak. J. Med. Entomol. 26(5): 435-448 (1989)

- Results report includes species name, common name, life stage (larva, nymph or adult), degree of engorgement (1+ to 5+), and whether the head of the tick is intact.

- Results are reported by phone and by mail. Faxed reports are available upon request.

- Specimens that are not ticks will be identified using insect keys on hand in lab or referred to:
  Dr. Wayne Gall, Regional Entomologist
  NYSDOH, Western Region Office
  584 Delaware Avenue
  Buffalo, NY 14202
  Phone: 716-847-4508

- Exotic ticks that are not included in the identification keys will be referred to:
  National Veterinary Services Laboratories
  1800 Dayton Road
  Ames, IA 50010
  Phone: 515-663-7266

ERIE COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH WELLNESS
VECTOR AND PEST CONTROL PROGRAM

462 Grider Street Room BB-122
Buffalo, NY 14215
716-898-3324

LAB USE ONLY
SR#: _____
Date Closed: _____
Closed By: _____

Tick Identification Request Form

Collection Information:

In removing and submitting ticks for identification, use the following procedure:

- Carefully remove ticks by grasping them as close to the skin as possible using fine tweezers and pull gently but firmly until they let go.
- Do not squeeze ticks or handle them with your bare hands.
- Place the whole tick in a tightly sealed container labeled with the victims name and collection date.
- Package carefully in a crush-proof container and send to the above address.
- When sending multiple ticks, a separate form must accompany each specimen.

Specimen Sent By	Name:			
	Address:			
	City:	County:	State:	Zip:
	Phone:	Fax:		
Tick Information	Date tick found:	Was the tick attached when found? ☐Yes ☐No		
If tick was found on a person	Name:	Phone:		
	Address:			
	City:	County:	State:	Zip:
	Sex ☐M ☐F	DOB or Age:		
	Part of body on which it was found:			
If tick was found on an animal	☐Cat ☐Dog ☐Other (specify)	Name of Animal:		
	Owner of Animal:	Phone:		
	Address:			
30 day travel history of victim, with dates				

Lab Use Only

Date rec'd:	Date of ID:	Processed by:
	Sample condition: ☐Good ☐Fair ☐Poor	

Identification			
	Species	Common name	
	☐ *Amblyomma americanum*	Lone Star Tick	
	☐ *Dermacentor variabilis*	American Dog Tick	
	☐ *Ixodes cookie*	Woodchuck Tick	
	☐ *Ixodes scapularis*	Blacklegged (Deer)Tick	
	☐ *Ixodes marxi*	Squirrel Tick	
	☐ *Rhipicephalus sanguineus*	Brown Dog Tick	
	☐ Other:		
	☐Larva ☐Nymph ☐Adult	Sex: ☐M ☐F	Damage: ☐Yes ☐No
	Degree of Engorgement: ☐1+ ☐2+ ☐3+ ☐4+ ☐5+		

Comments		
Phone Report to:	Date & Time:	

6/03

SPECIMENS OTHER THAN TICKS IDENTIFIED

Specimens Other Than Ticks Identified in 2003		
Species	Common Name	Number Identified
Crematogaster spp.	Acrobat Ant*	1
Dermestes lardarius	Larder Beetle*	1
Dytiscus spp.	Predacceous diving beetle*	1
Lipoptena cervi Order: Hippobosidae)	Deer ked*	1
Oryzaephilus mercator	Merchant Grain Beetle**	1
Order: Coleoptera Family: Carabaeidae	Scarab Beetle*	1
Order: Hemiptera Family: Reduviidae)	Assassin Bug Nymph*	1
Phycitine moth	Possibly an Indian mealmoth*	1
---	Debris	3
Total		**11**
*Identified by Dr. Wayne Gall, NYSDOH Regional Entomologist **Confirmed by Dr. Wayne Gall, NYSDOH Regional Entomologist		

Specimens Other Than Ticks Identified in 2002		
Species	Common Name	Number Identified
Anthrenus fuscus	Dermestid beetle*	2
Contarinia negundifolia	Boxelder Leaf Gall Midge Larvae*	1
Leptoglossus occidentalis	Western Conifer Seed Bug*	1
Otiorhynchus ovatus	Strawberry Root Weevil*	1
Pediculus humanus capitis	Head Louse**	1
Phormia regina	Black Blow Fly Larvae*	1
Thermobia domestica	Firebrat*	1
Vespa crabro	European Hornet aka Giant Hornet*	1
Ctenocephalides felis	Cat Flea**	1
Family: Cerambycidae	Long-Horned Beetle*	1
Genus: Cimex	Nymph, probable bedbug*	1
---	Ermine Moth*	1
---	Silverfish*	1
---	Black Carpet Beetle*	1
---	Plant Material	1
---	Insect Parts Not From a Tick	1
---	Debris	3
Total		**20**
*Identified by Dr. Wayne Gall, NYSDOH Regional Entomologist **Confirmed by Dr. Wayne Gall, NYSDOH Regional Entomologist		

Specimens Other Than Ticks Identified in 2001		
Species	Common Name	Number Identified
Cimex lectularius	BED BUG*	2
Eristalis tenax	Rat-Tailed Maggot*	1
Order: Diptera Family: Hippoboscidae	KED or LOUSE FLY**	1
---	Bird Mite*	1
---	Debris	3
---	No Tick in Container	1
Total		**9**
*Identified by Dr. Jacques Berlin, NYSDOH Regional Entomologist (Retired) **Confirmed by Dr. Jacques Berlin, NYSDOH Regional Entomologist (Retired)		

ACKNOWLEDGMENTS

Erie County Health Department

Anthony Billittier M.D., F.A.C.E.P. - Commissioner of Health

Environmental Health Wellness

John Kociela - Public Health Director

Report Compiled By:

Vector and Pest Control Program

_____ February 26, 2004

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Note: Photos in this document were taken using a JVC 3.3 Megapixel Digital Camera installed on the Leica GZ7 Stereo Microscope at the Vector Lab.

Technical Assistance:

New York State Department of Health

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